

# INTEGRATED OPTICAL PROBES

## *Abstract*

Optical probes used in velocimetry measurements have typically been individual probes that collect data for a single diagnostic at a single point. These probes have been used in diagnostics such as VISAR, PDV, and radiometry, which measure surface velocity, temperature, and other characteristics. When separate probes are used for these measurements, the different diagnostic points measured must be significantly separated. We have developed integrated probes that collect data for multiple optical diagnostics; these probes measure focused points in close proximity.

T100EEU042307

## Contributors

### National Security Technologies, Inc.

Brent C. Frogget

Douglas O. DeVore

Paul A. Flores

Vincent T. Romero

David L. Esquibel

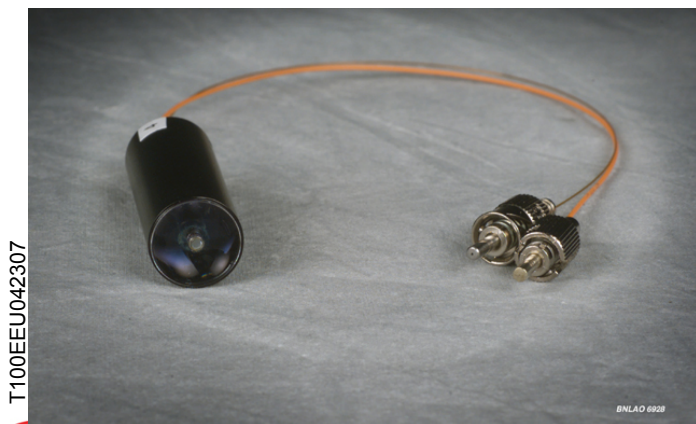
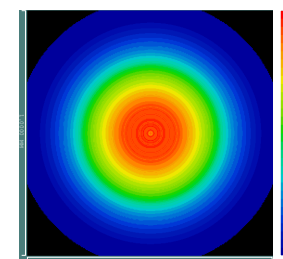
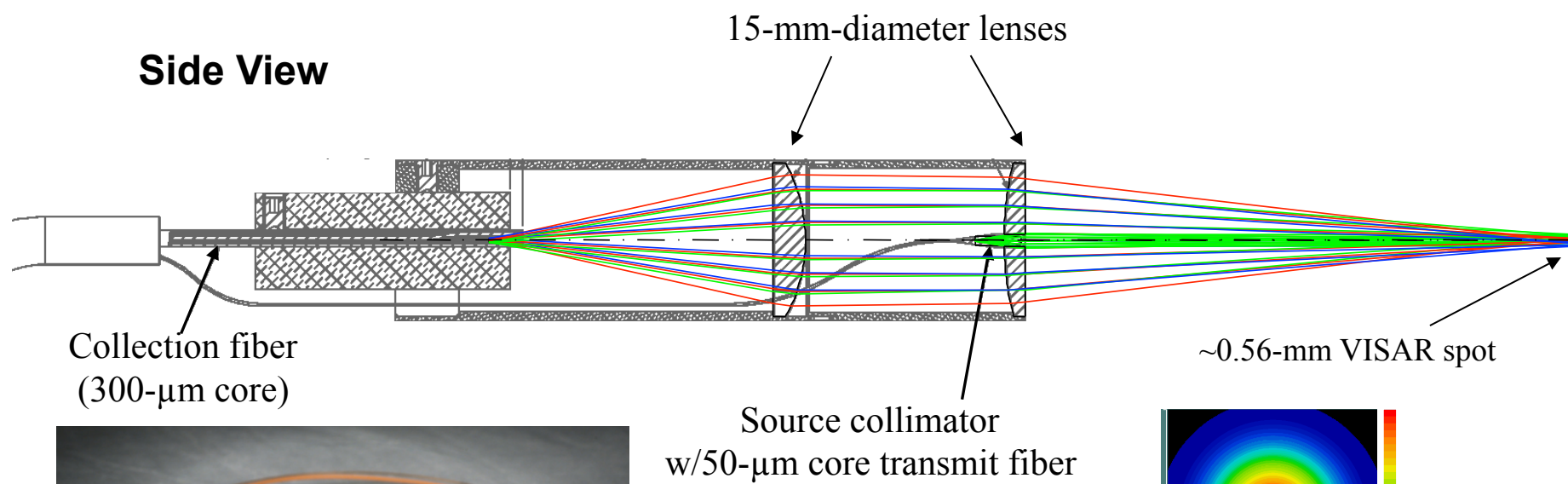
### Los Alamos National Laboratory

David B. Holtkamp

Michael A. Shinas

T100EEU042307

# Single 5/8-inch-diameter VISAR Probe



T100EEU042307

BNLAD 0928

# Multi-fiber VISAR Probe

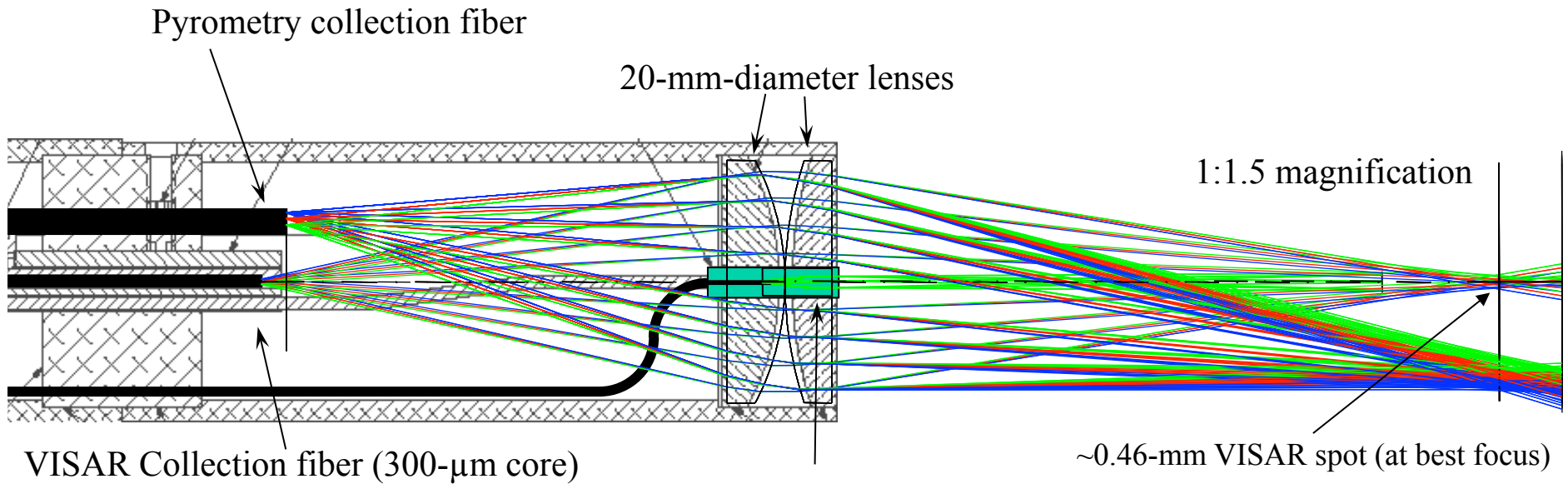


T100EEU042307

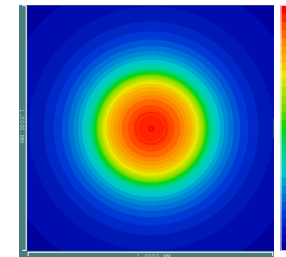


# Combination Pyrometry/VISAR Probe (Armando)

**Side View** 7/8-inch-diameter housing



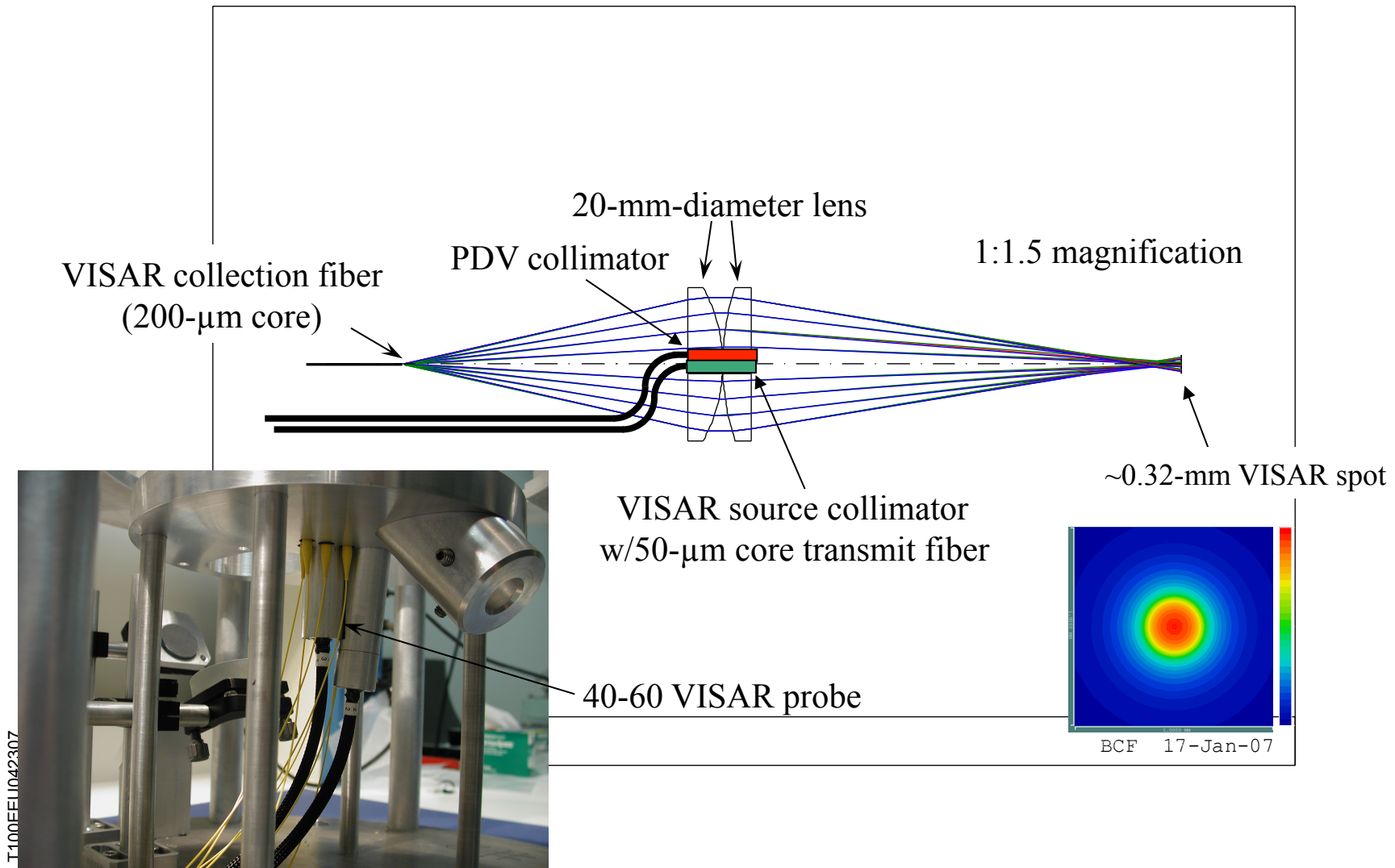
Source collimator  
w/50-μm core VISAR transmit fiber



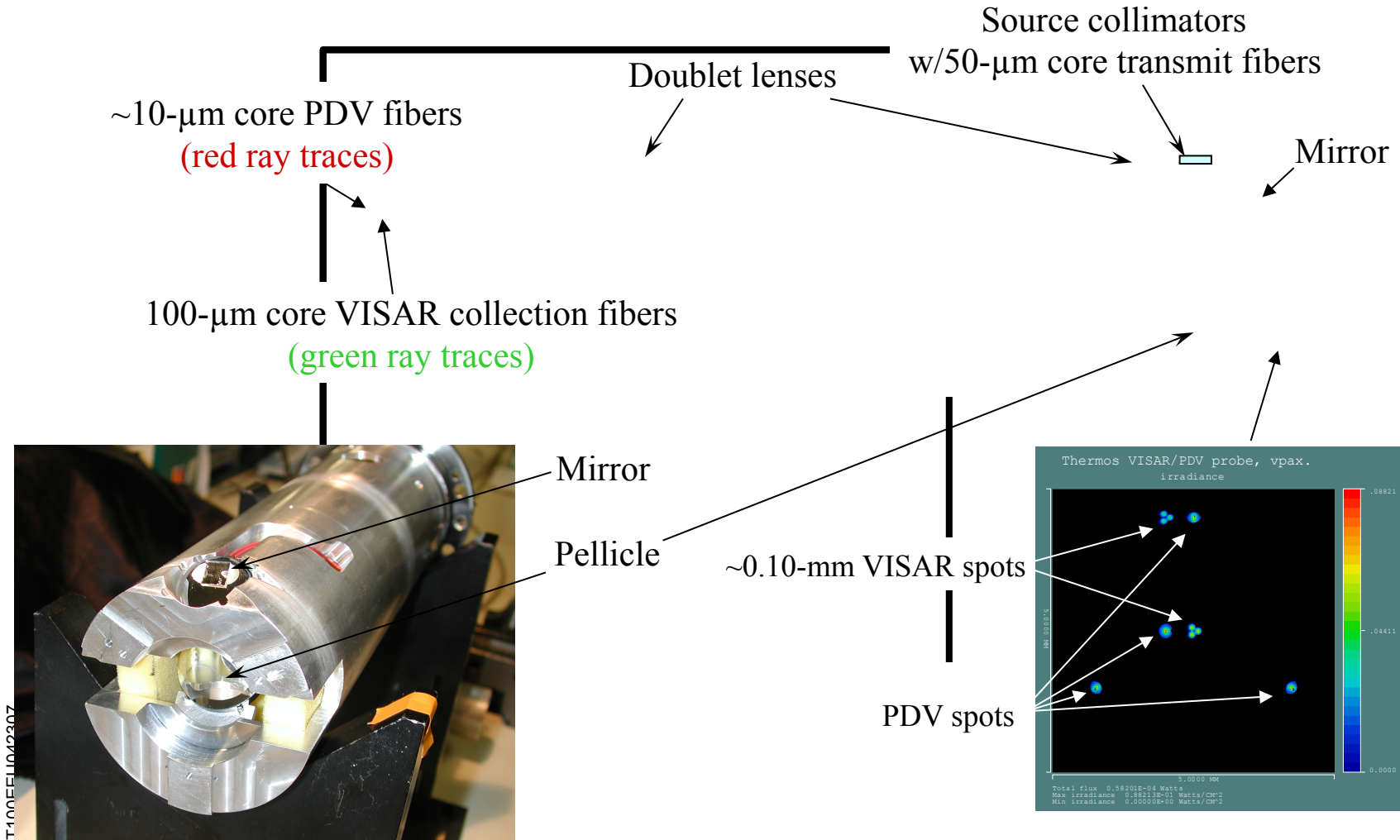
**National Security Technologies LLC**  
Vision • Service • Partnership

Vision • Service • Partnership

# Barolo PRAD 40-60 VISAR/PDV Probe



# Thermos VISAR/PDV probes



T100EEL1042307



# Thermos Alignment Reticule Image

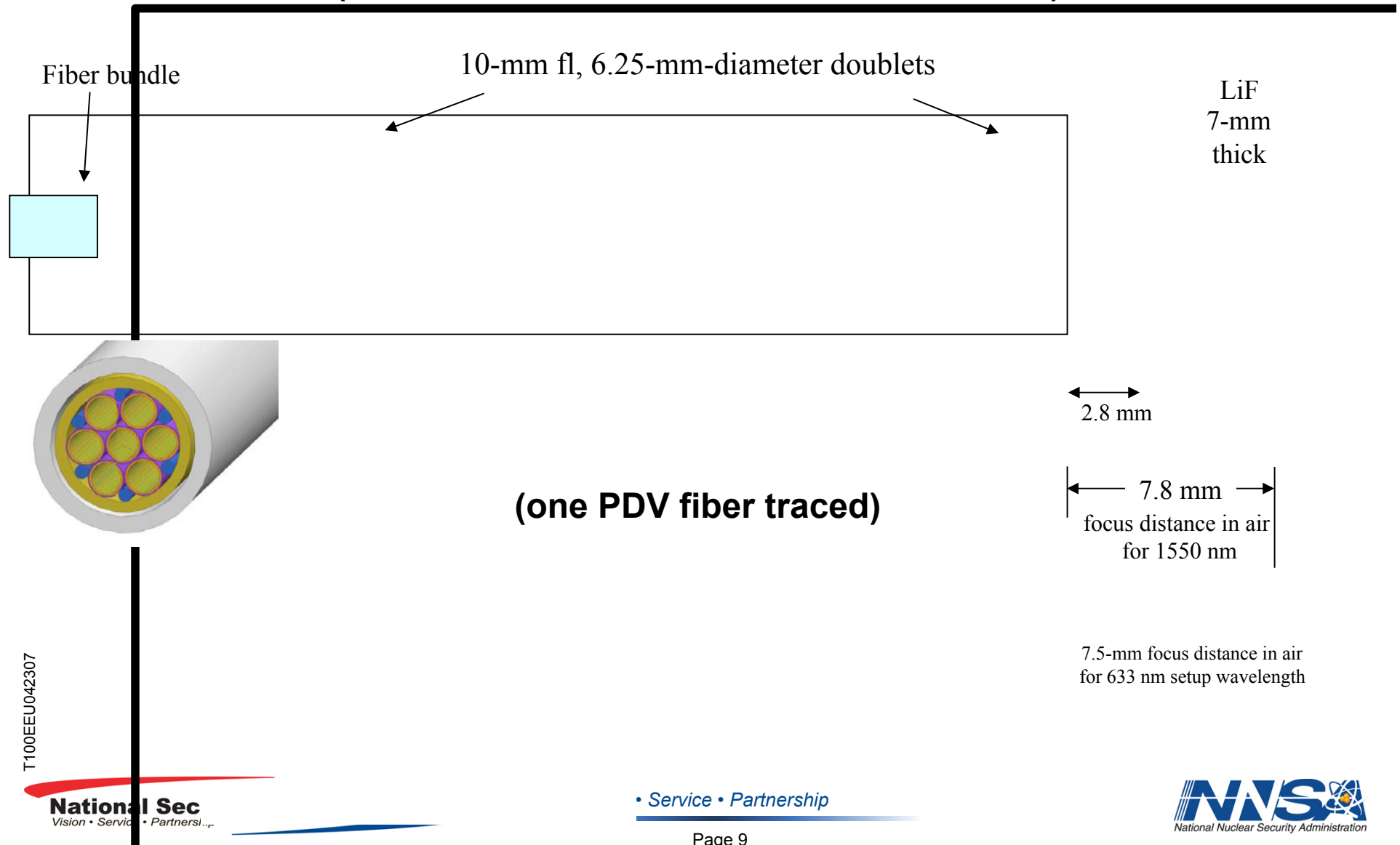


T100EEU042307

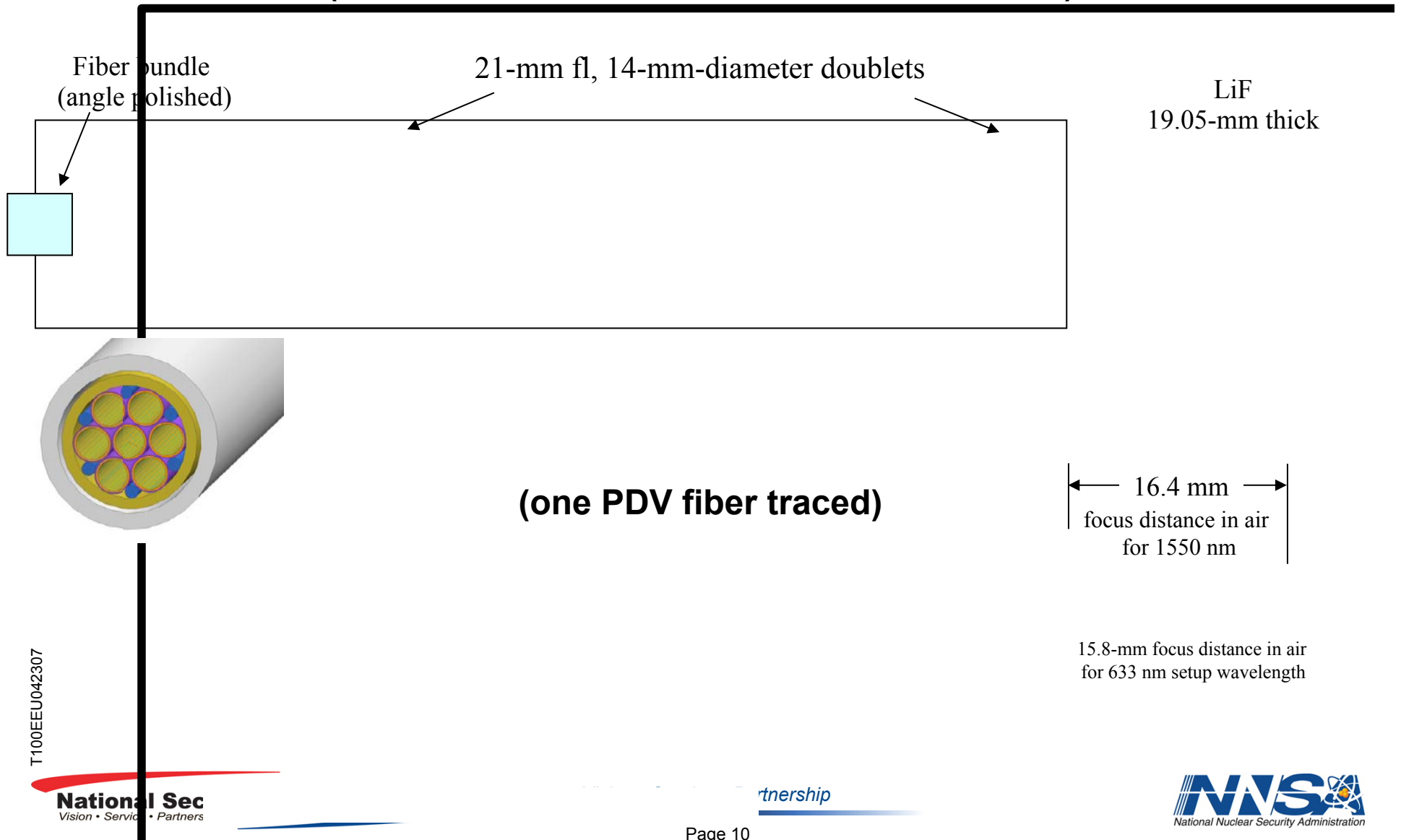


# Ray Trace of Small PDV/Radiometry Probe

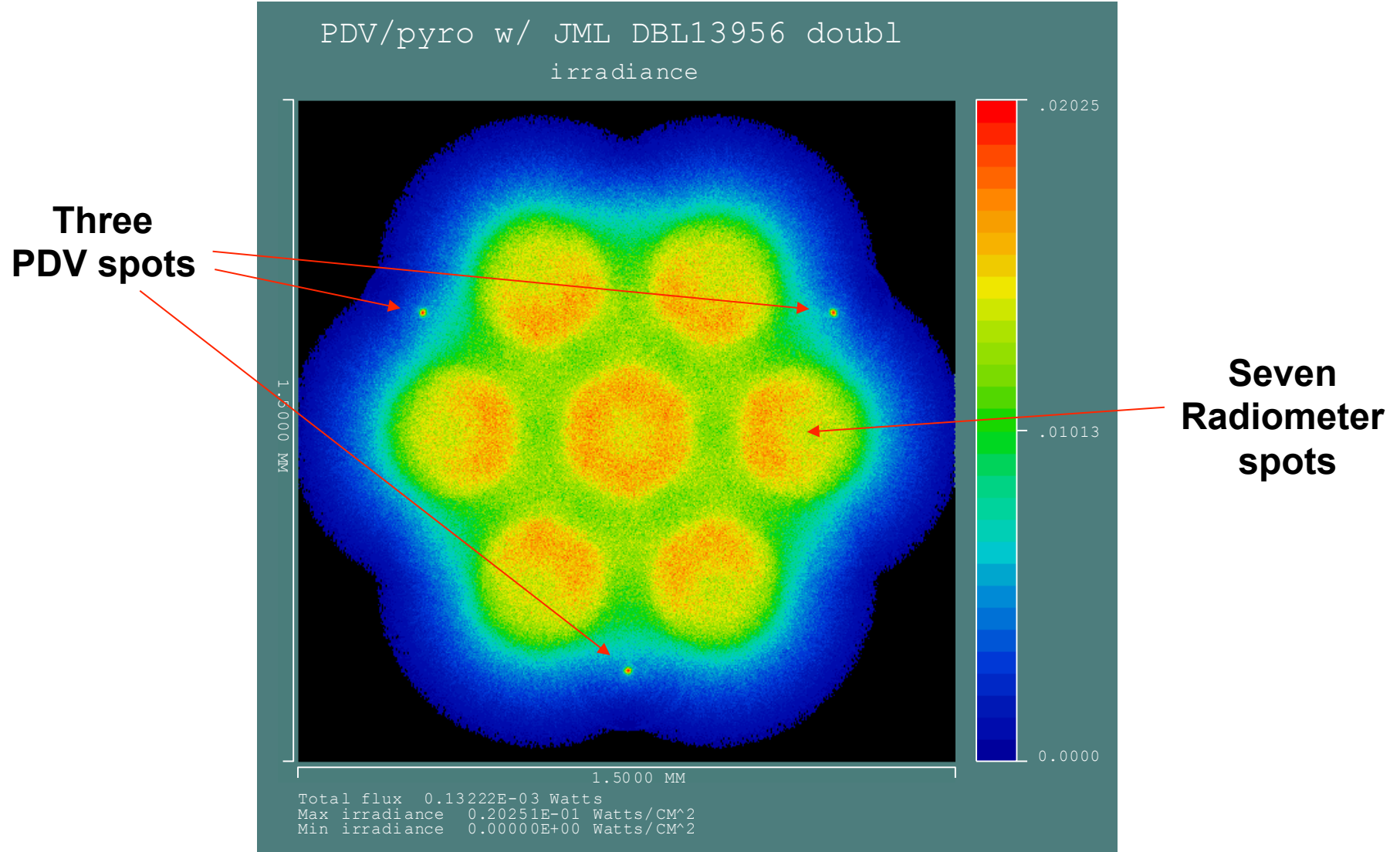
(two PDV and two Radiometer fibers traced)



# Ray Trace of Powder Gun PDV/Radiometry Probe (one PDV and three Radiometer fibers traced)

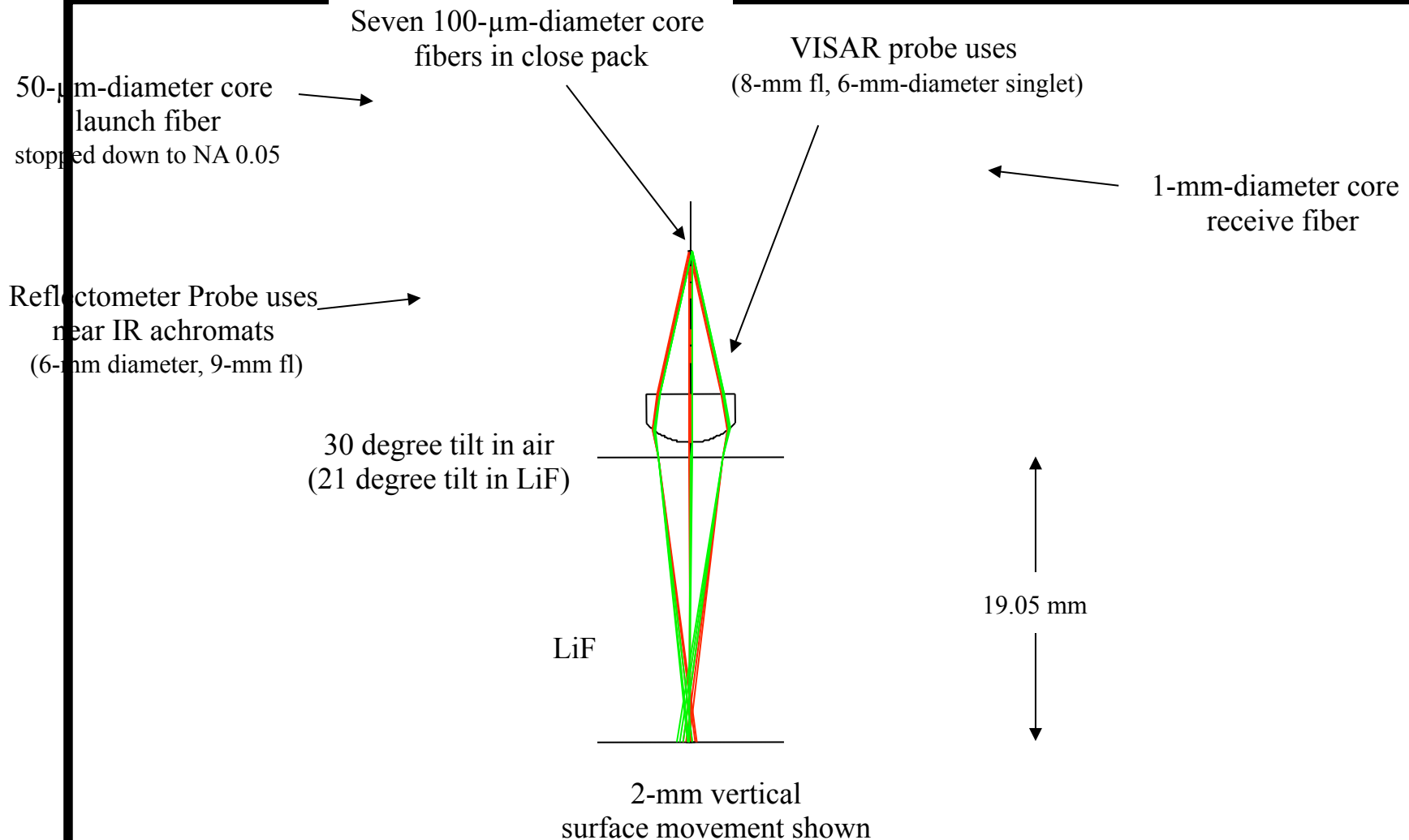


# Fiber Bundle Output Illumination Analysis at PDV Focus



T100EEU042307

# Ray Traces of VISAR Probe (center) with Reflectometer Probe (at angle)



T100EEU042307



# Summary

## Integrated Optical Probes

- (Armando) Pyrometry/VISAR Probe
- Barolo PRAD 40-60 VISAR Probe with built-in PDV Probe
- Thermos VISAR/PDV Probes
- Small PDV/Radiometry Probes
- Powder Gun PDV/Radiometry Probes
- Future VISAR/Reflectometry Probes

These probes measure focused target points that are in close proximity.

T100EEU042307